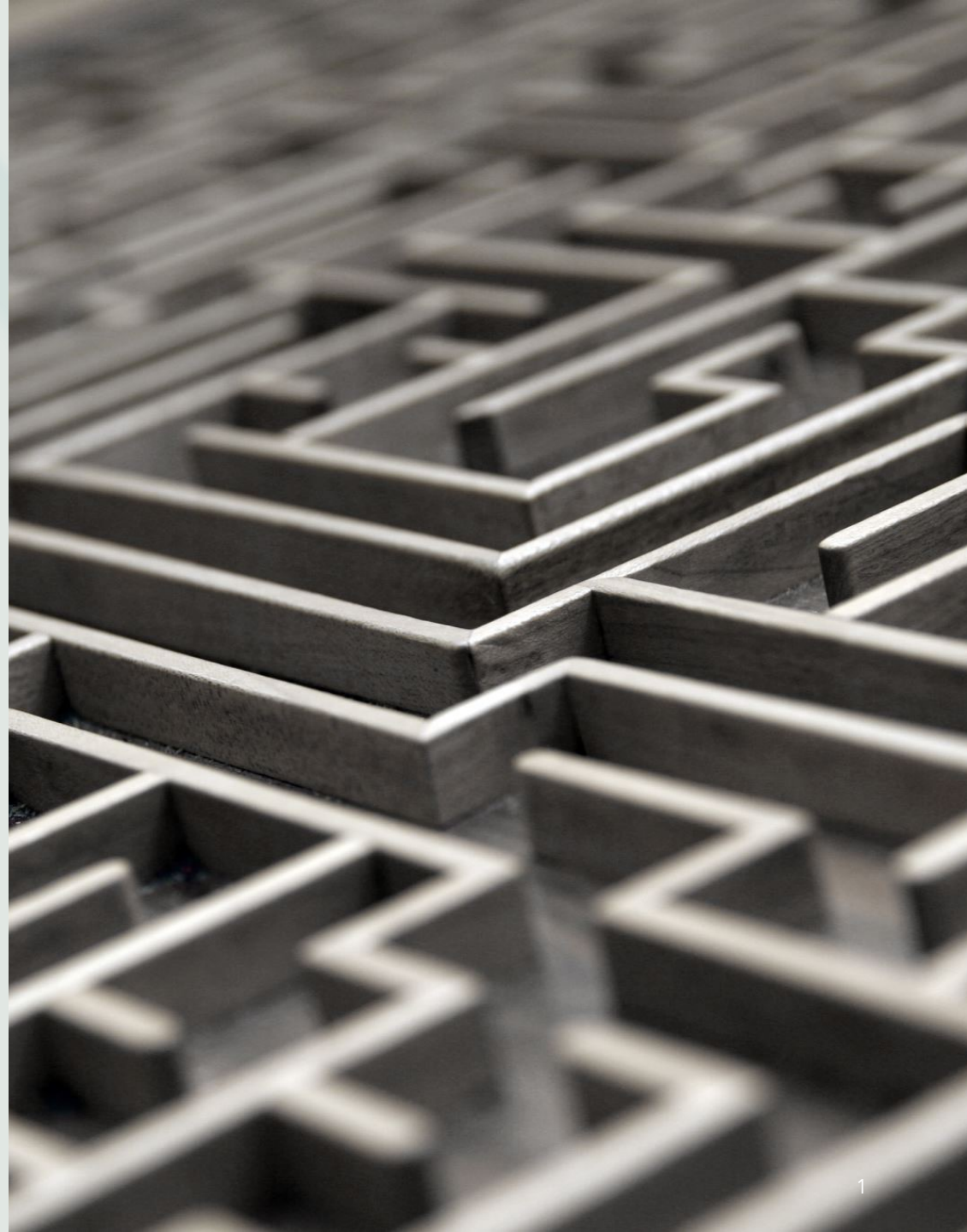# Medical Geography
## Emergency Medical Service

**Chun-Hsiang Chan Ph.D.**

Department of Geography,
National Taiwan Normal University

# Outline

- EMS Definition
- EMS History
- CPR
- EMS Dispatch

# The Parable of the Good Samaritan

- **25** And behold, a lawyer stood up to put him to the test, saying, "Teacher, what shall I do to inherit eternal life?"

- **26** He said to him, "What is written in the Law? How do you read it?"

- **27** And he answered, "You shall love the Lord your God with all your heart and with all your soul and with all your strength and with all your mind, and your neighbor as yourself."

- **28** And he said to him, "You have answered correctly; do this, and you will live."

- **29** But he, desiring to justify himself, said to Jesus, "And who is my neighbor?"

- **30** Jesus replied, "A man was going down from Jerusalem to Jericho, and he fell among robbers, who stripped him and beat him and departed, leaving him half dead.

# The Parable of the Good Samaritan

- **31** Now by chance a priest was going down that road, and when he saw him he passed by on the other side.

- **32** So likewise a Levite, when he came to the place and saw him, passed by on the other side.

- **33** But a Samaritan, as he journeyed, came to where he was, and when he saw him, he had compassion.

- **34** He went to him and bound up his wounds, pouring on oil and wine. Then he set him on his own animal and brought him to an inn and took care of him.

- **35** And the next day he took out two denarii and gave them to the innkeeper, saying, 'Take care of him, and whatever more you spend, I will repay you when I come back.'

- **36** Which of these three, do you think, proved to be a neighbor to the man who fell among the robbers?"

- **37** He said, "The one who showed him mercy." And Jesus said to him, "You go, and do likewise."

# Good Samaritan law

- In the United States and Canada, there is a law that exempts rescuers who voluntarily provide assistance to the injured and sick from liability.

- The purpose is to enable those who do good deeds without having to worry about being held accountable for causing casualties due to negligence, thus encouraging bystanders to respond to injuries and deaths.
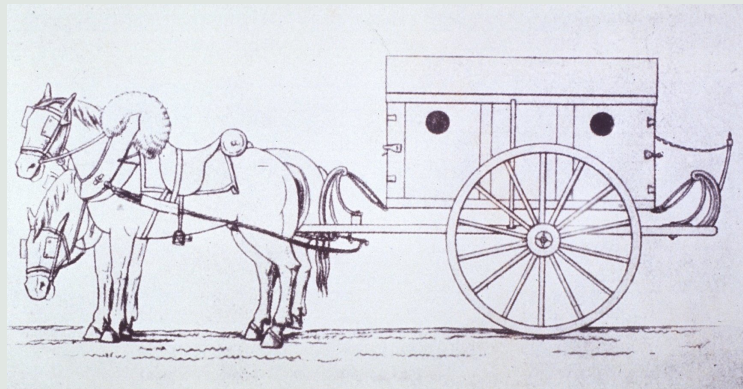
Chun-Hsiang Chan (2023)

# EMS Definition

- **Definition from Wiki:**

- Emergency medical services (EMS), also known as ambulance services or paramedic services, are emergency services that provide urgent pre-hospital treatment and stabilization for serious illness and injuries and transport to definitive care.

# EMS History – Ambulance & Triage

- **Dominique Jean, Baron Larrey** (8 July 1766 – 25 July 1842) was a French surgeon and military doctor, who distinguished himself in the French Revolutionary Wars and the Napoleonic Wars. An important innovator in battlefield medicine and triage, he is often considered the first modern military surgeon.

# EMS History – Triage





Source: https://health.udn.com/health/story/6001/847241
https://www.jobforum.tw/discussTopic.asp?id=221386

# EMS History

The **Crimean War** was fought from October 1853 to February 1856 between Russia and an ultimately victorious alliance of the Ottoman Empire, France, the United Kingdom and Sardinia-Piedmont.

| | |
|---|---|
| **Date** | 16 October 1853 – 30 March 1856 (2 years, 5 months and 2 weeks) |
| **Location** | Crimea, North Caucasus, Balkans, Black Sea, Baltic Sea, White Sea, Far East |
| **Result** | Allied victory |
| **Territorial changes** | Russia loses the Danube Delta and Southern Bessarabia. |

### Belligerents

| | |
|---|---|
| 🇹🇷 Ottoman Empire | 🇷🇺 Russia |
| 🇫🇷 France[a] | |
| 🇬🇧 United Kingdom[a] | 🇬🇷 Greek Volunteer Legion |
| 🇮🇹 Sardinia[b] | |



W. Simpson, del ___ E. Morin, lith.    Published Oct' 22nd 1855, by Paul & Dominic Colnaghi & C° 13 & 14 Pall Mall East ___ Publishers to Her Majesty.    Day & Son, Lith^rs to the Queen

DÉPOSÉ
Paris. Goupil & Cie
LEIPZIG, OTTO WEIGEL

THE ATTACK ON THE MALAKOFF.

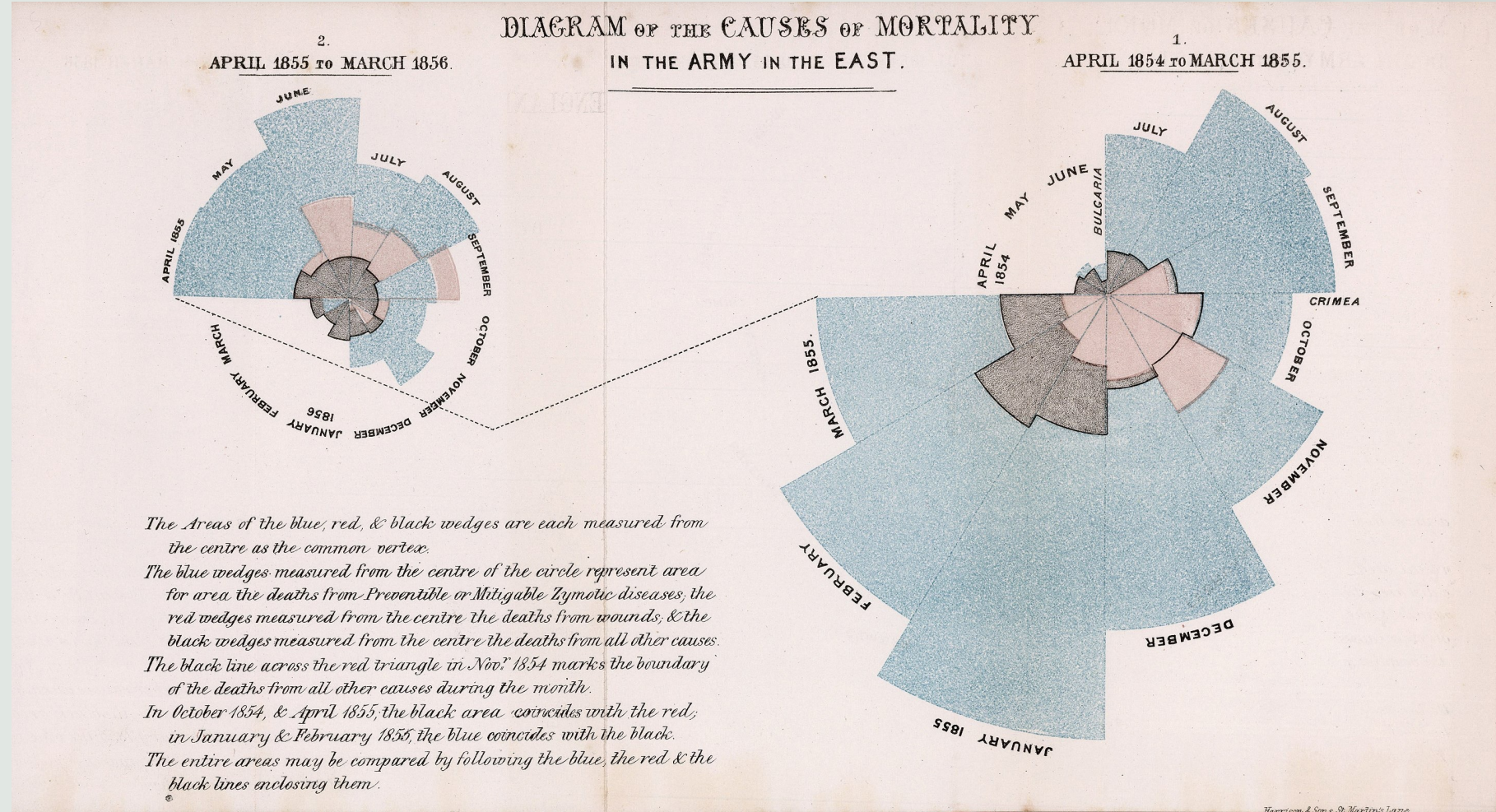PLATE 18                    COLNAGHI'S AUTHENTIC SERIES

# EMS History

**Florence Nightingale** (12 May 1820 – 13 August 1910) was an English social reformer, statistician and the founder of modern nursing. Nightingale came to prominence while serving as a manager and trainer of nurses during the Crimean War, in which she organised care for wounded soldiers at Constantinople.
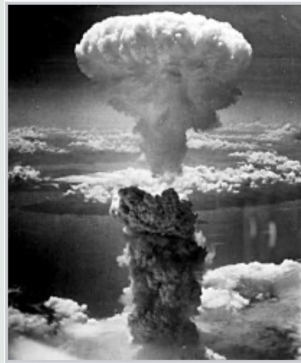
# EMS History



Am Civil War : 1861
Mortality: 25%
Transport time: 72 hrs

World War I : 1914
Mortality: 8.6%
Transport time: 8 hrs
Ambulance

World War II : 1939
Mortality: 4.5%
Transport time: 4 hrs
Ambulance, Plasma, Antibiotics

# EMS History



Korean War: 1951
Mortality: 2.5%
Transport time: 1.2 hrs
Helicopter, MASH Units

Vietnam War: 1965
Mortality: 1.9%
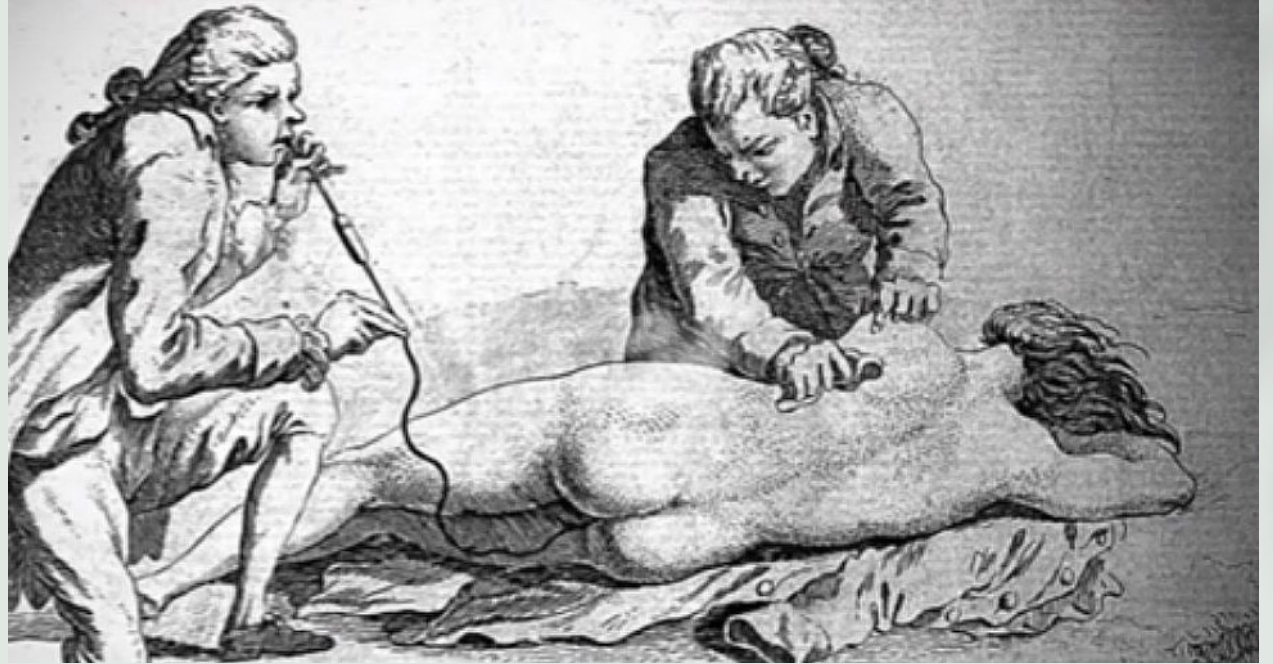Transport time: 27 mins
Helicopter, Fixed wing

# EMS History

- Cleanse the mouth and nose **A**
- Compress the chest **C**
- Insufflate the lung with air **B**
- If this proves impossible, perform a tracheotomy. **B**
- Apply electric shocks to the heart **D**
- Place bladders filled with hot water on the stomach and feet.
- Administer a stimulant clyster
- Shake the victim vigorously
- Continue remedies above for hours.
- Finally, apply red-hot irons to the feet or other sensitive places.

Life-saving Measures ~by Herholdt JD and Rafn CG in 1800
Baskett PJ. Resuscitation. 2003;58:283-8.

# EMS History

- In the 1600s, Thomas Sydenham suggested the use of tobacco smoke enemas to add heat and stimulation to the decedent, and this technique was used through the 1800s until better methods emerged.



- In the case of drowning, which remained the most common identifiable cause of sudden death throughout most of history, both tobacco smoke enemas and hanging individuals upside down were utilized.
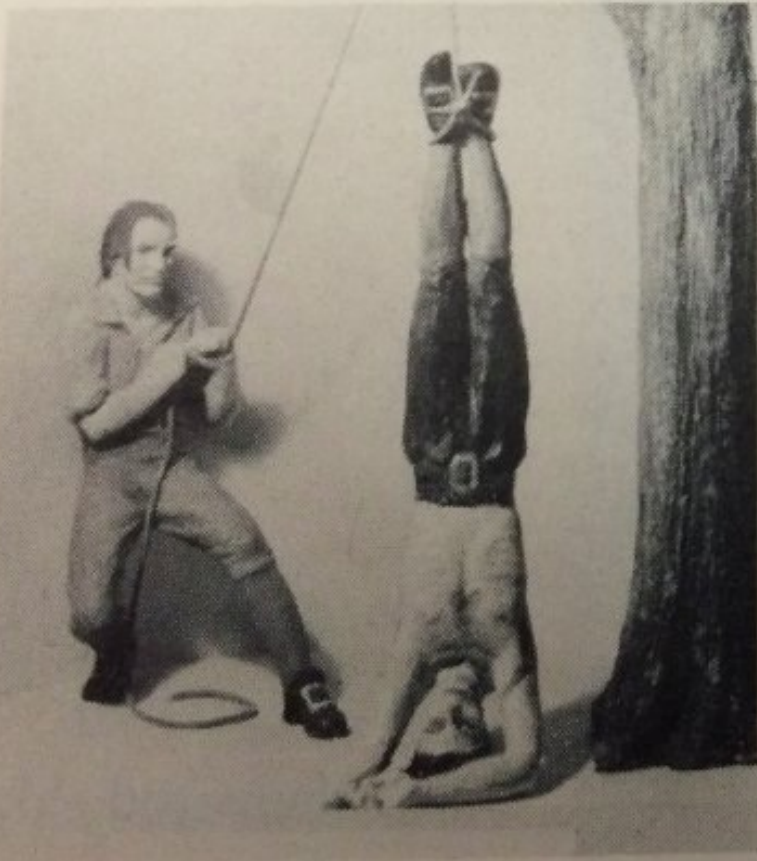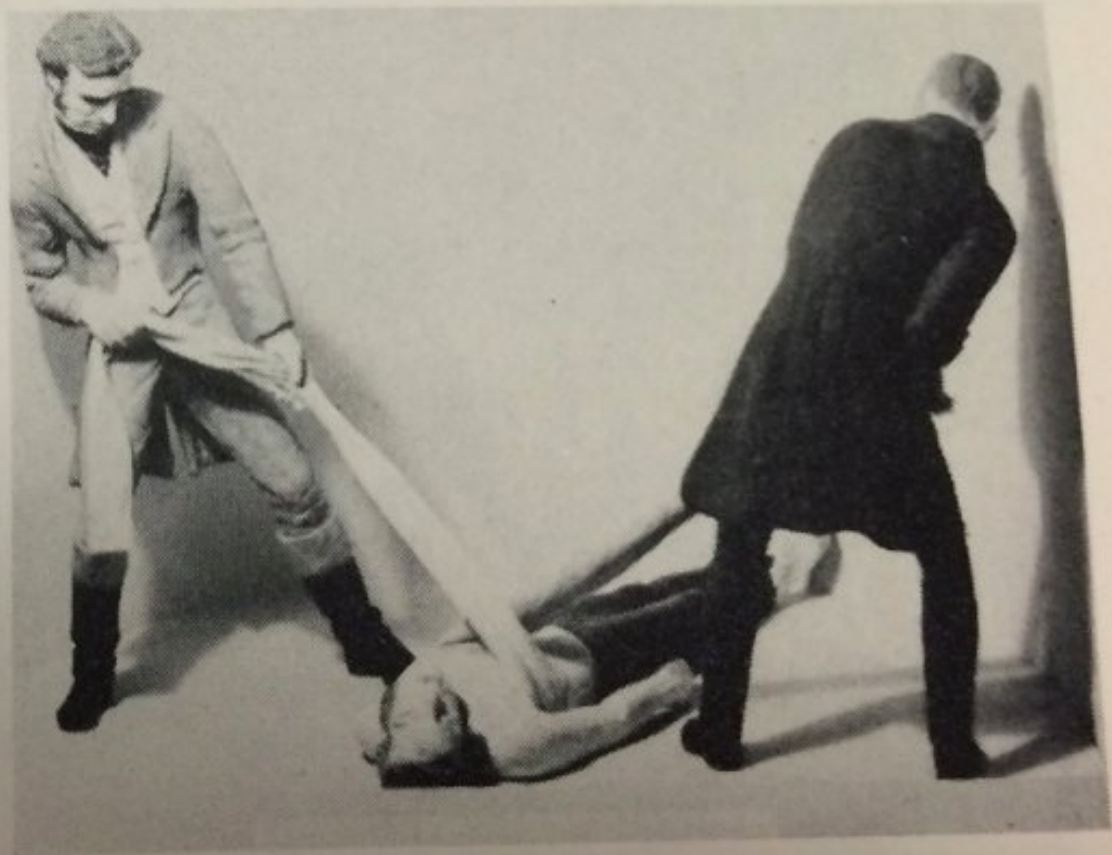
# EMS History – Resuscitation

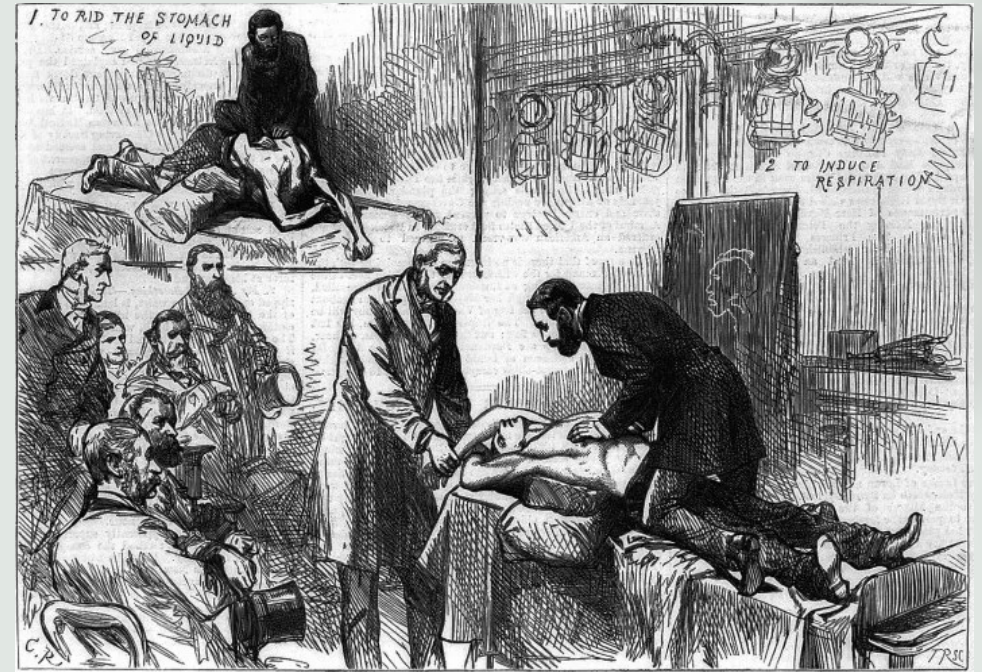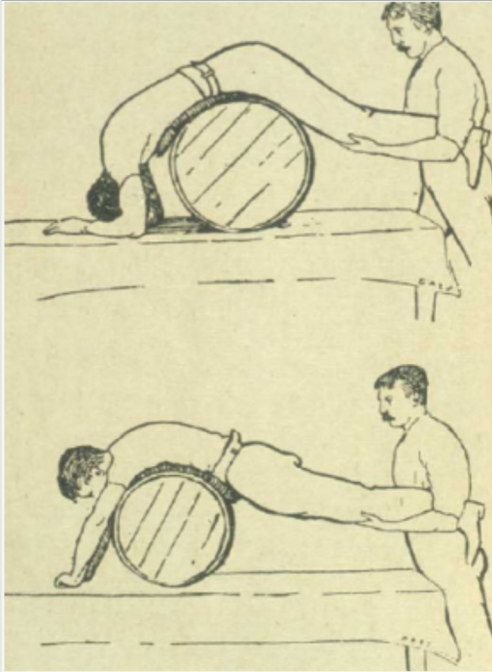# EMS – Resuscitation



3. 1770—INVERSION METHOD

4. 1831—DALRYMPLE METHOD

# EMS History – Resuscitation



In the mid-1700s, there was greater awareness about the life-sustaining concept of breathing and thus efforts began to focus on recreating inspiration and expiration, such as rolling the dead over a large barrel, hanging them over the back of a horse which was forced to trot, and repeatedly tightening and loosening a cloth tied around the chest.
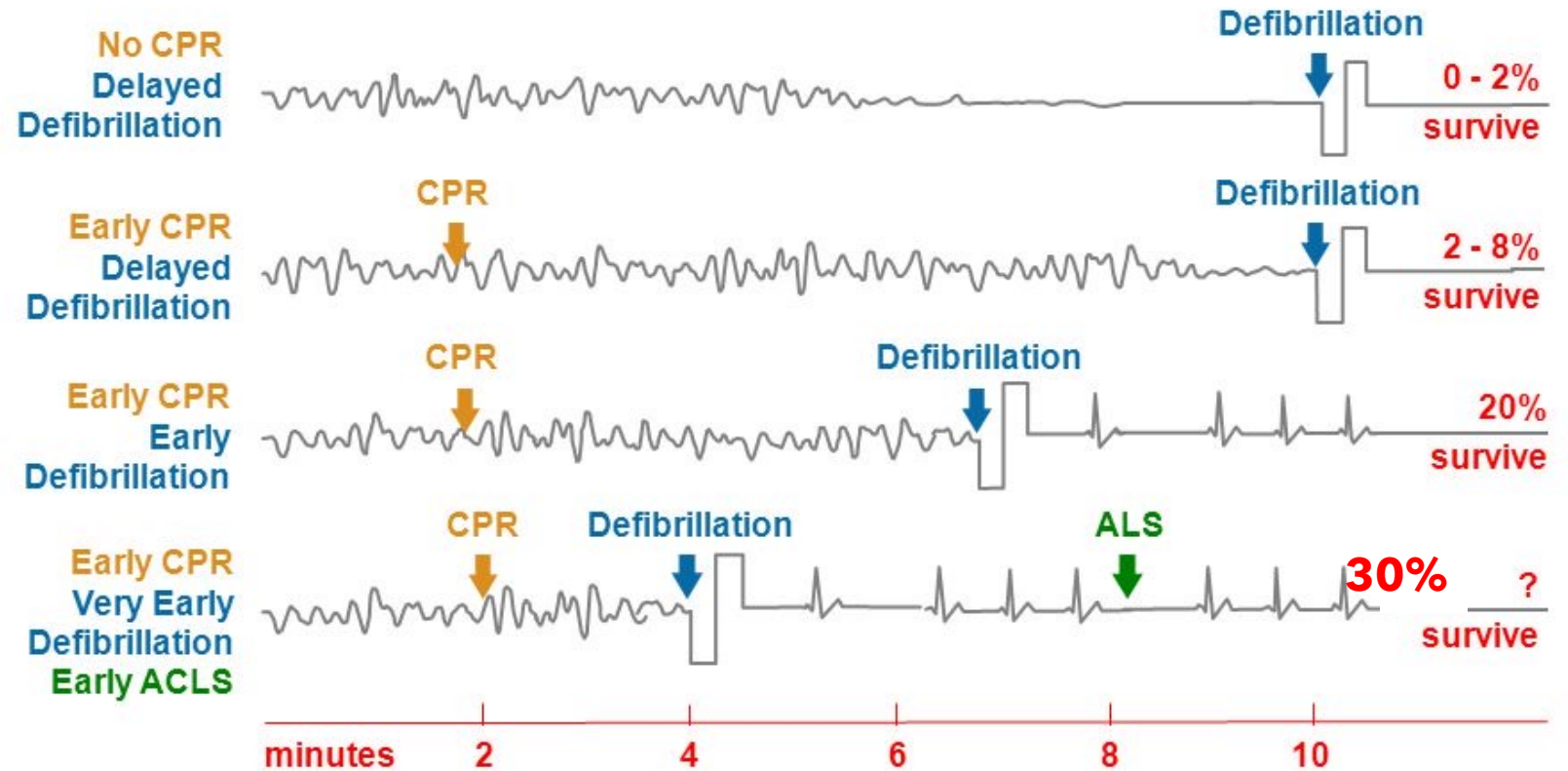
# CPR

**IHCA**



| 即早辨識和預防 | 緊急應變系統啟動 | 高品質 CPR | 去顫 | 心臟停止後照護 | 復原 |

**OHCA**



| 緊急應變系統啟動 | 高品質 CPR | 去顫 | 高級心肺復甦 | 心臟停止後照護 | 復原 |

# CPR

# EMS Dispatch

- Manpower

- Training

- Communications

- Transportation

- Facilities

- Healthcare Accessibility

- Patient Transfer Service

- Critical Care Units

- Public Safety Agencies

- Consumer Participation

- Record

- Education

- Evaluation

- Disaster Response

- Mutual Aid

馬惠明。民眾基本救護課程講義

# EMS Dispatch – Goals

- The right patient (對的病人)

- To the right place (對的場所)

- At the right time (對的時間)

- With the right service (對的服務)

馬惠明。民眾基本救護課程講義

# EMS Dispatch

- First Responder (第一反應者)
- Activation (系統啟動)
- Scene Care (現場救護)
- Scene Control (現場控制)
- Ambulance Care (救護車)
- Critical Care Transport (重症運輸)

馬惠明。民眾基本救護課程講義

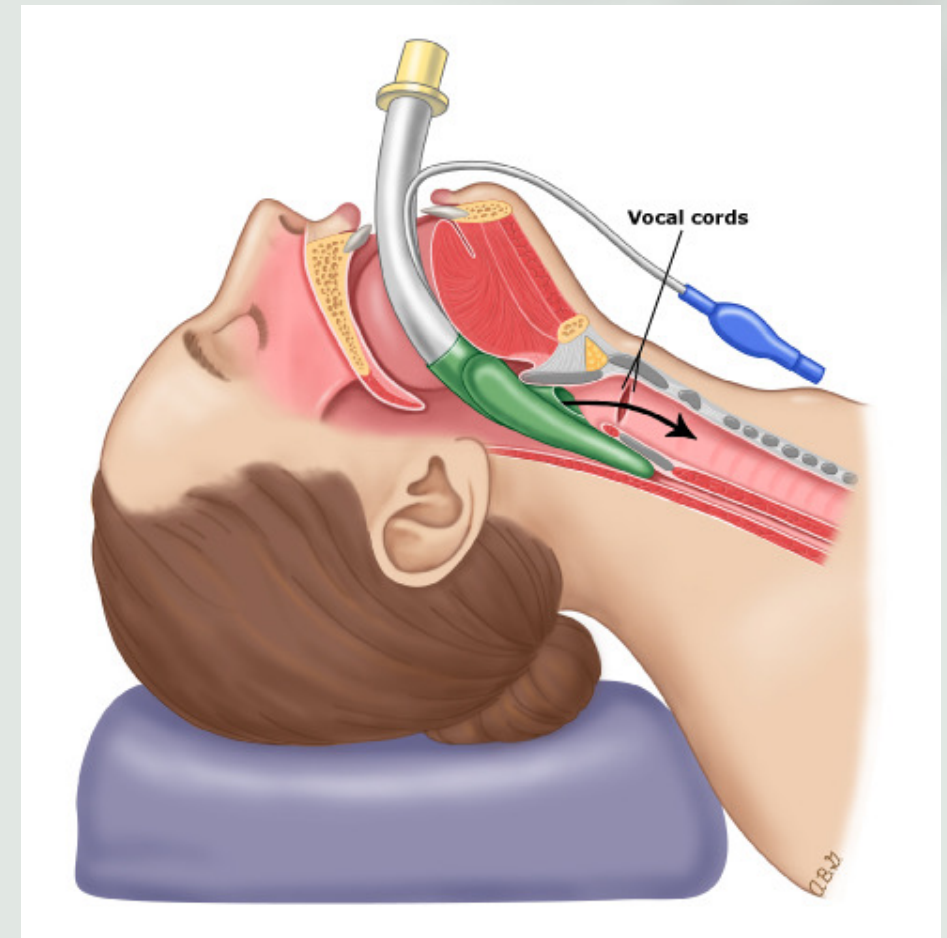Chun-Hsiang Chan (2023)

# EMS Dispatch

| Level | Training (Hr) | Range |
|-------|---------------|-------|
| EMT-1 | 40 | Frist responder, BLS-D |
| EMT-2 | 280 | BLS, LMA, Fluids |
| EMT-P | 1280 | Advanced life support |





Vocal cords

# EMS Dispatch

| 區域別 | EMT-1 | EMT-2 | EMT-P | 小計 |
|---|---|---|---|---|
| 總計 | **841** | **12,092** | **1,436** | **14,369** |
| 臺北市 | 59 | 1,259 | 141 | 1,459 |
| 新北市 | 90 | 1,555 | 453 | 2,098 |
| 桃園市 | 99 | 1,172 | 154 | 1,425 |
| 臺中市 | 58 | 1,315 | 93 | 1,466 |
| 臺南市 | 56 | 841 | 164 | 1,061 |
| 高雄市 | 43 | 1,317 | 128 | 1,488 |
| 宜蘭縣 | 15 | 268 | 19 | 302 |
| 新竹縣 | 30 | 310 | 13 | 353 |
| 苗栗縣 | 9 | 329 | 17 | 355 |
| 彰化縣 | 47 | 574 | 34 | 655 |
| 南投縣 | 4 | 326 | 25 | 355 |
| 雲林縣 | 32 | 357 | 25 | 414 |
| 嘉義縣 | 18 | 347 | 21 | 386 |
| 屏東縣 | 30 | 466 | 19 | 515 |
| 臺東縣 | 7 | 280 | 25 | 312 |

| 區域別 | EMT-1 | EMT-2 | EMT-P | 小計 |
|---|---|---|---|---|
| 總計 | **841** | **12,092** | **1,436** | **14,369** |
| 花蓮縣 | 53 | 225 | 18 | 296 |
| 澎湖縣 | 21 | 128 | 8 | 157 |
| 基隆市 | 11 | 200 | 6 | 217 |
| 新竹市 | 11 | 238 | 24 | 273 |
| 嘉義市 | 5 | 219 | 31 | 255 |
| 金門縣 | 9 | 84 | 6 | 99 |
| 連江縣 | 0 | 25 | 0 | 25 |
| 基隆港 | 5 | 31 | 0 | 36 |
| 臺中港 | 3 | 26 | 0 | 29 |
| 高雄港 | 12 | 85 | 7 | 104 |
| 花蓮港 | 0 | 10 | 0 | 10 |
| 特搜隊 | 4 | 67 | 3 | 74 |
| 消防署 | 110 | 38 | 2 | 15 |

# The End

Thank you for your attention!

Email: chchan@ntnu.edu.tw
Web: toodou.github.io

SCAN
ME

SCAN ME